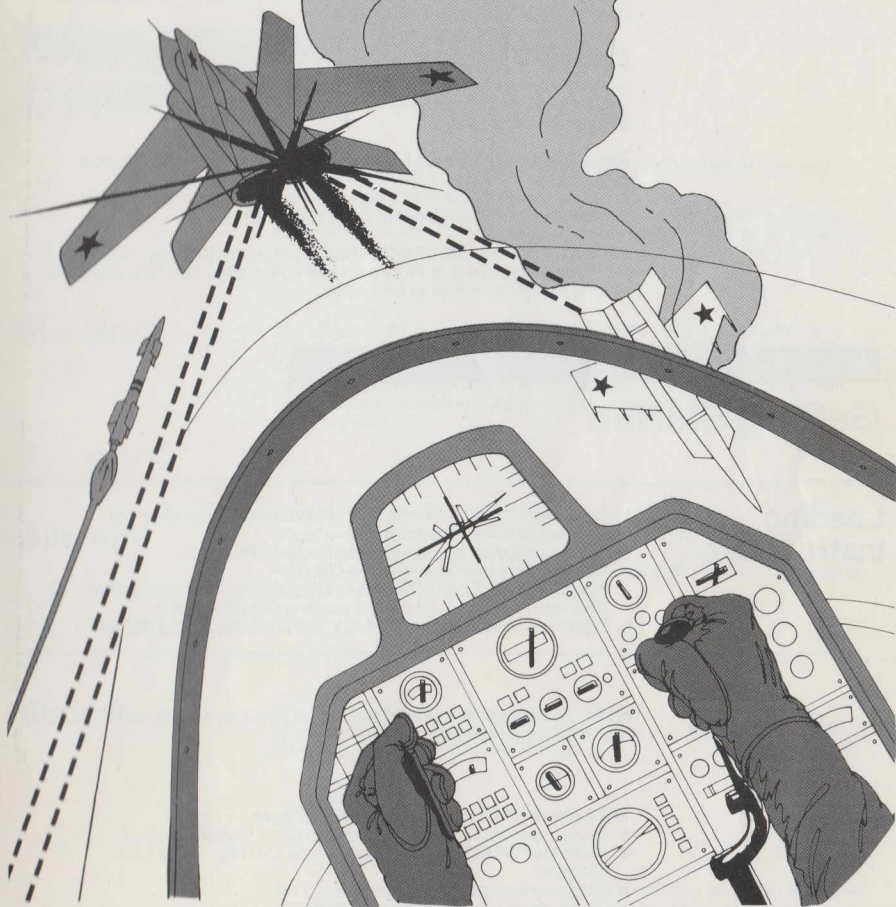# EPYX™
COMPUTER SOFTWARE

JET COMBAT SIMULATOR™

INSTRUCTION MANUAL
for the Commodore 64™

Game Program Designed by D. K. Marshall.   Adapted for the Commodore 64 by Darrel D.

Learn to Fly the World's Fastest Close-Combat Jet Fighter!

The McDonnell Douglas F-15 Eagle accelerates in a flash, turns on a dime, and can be quite unforgiving. At 30,000 feet and 1200 miles per hour, one false move can send you spiralling into the ground in under 30 seconds.

This is no place for a rookie.

JET COMBAT SIMULATOR™ puts you right in the pilot's seat to fly the F-15 the way the pro's do. In this computer-controlled simulation of actual flying conditions, you can practice take-offs, landings, aerial maneuvers, and close-combat dogfights.

JET COMBAT SIMULATOR recreates the control environment of the F-15 Eagle, the world's fastest climbing close-combat jet fighter. This simulation offers a view from the cockpit window, fully computerized flight instrumentation, full aerobatic maneuverability—you even control your flaps and landing gear.

And, JET COMBAT SIMULATOR is set up to recreate such dynamic factors as cross-winds, turbulence, and blind landings. With four separate missions, from landing practice to air-to-air combat, you can try your hand at the full range of flying conditions.

Fly against enemy aircraft piloted by inexperienced trainees—or by the most combat-tested ace. Work your way up the ranks and take your place among today's top-rated jet pilot aces!

Getting Started

Loading Instructions

- Set up your Commodore 64™ as shown in the Owner's Manual.
- Remove all disks from the drives.
- Plug your joystick (if you are using one) into **Port #2.**
- Turn the computer and disk drive ON.
- Insert the JET COMBAT SIMULATOR program into the disk drive, label facing UP, the oval cutouts pointing toward the back.
- Type the command **LOAD"*",8,1** and press the **RETURN** key.

Note: To improve the clarity of the display panel, turn down the brightness of your television or monitor.

With the EPYX FAST LOAD™ Cartridge:
- Set up your Commodore 64 as shown in the Owner's Manual.
- Insert the FAST LOAD Cartridge into the cartridge slot of your computer.
- Plug your joystick into **Port #2.**
- Turn the computer and disk drive ON.
- Insert the JET COMBAT SIMULATOR program into the disk drive, label facing UP, oval cutouts pointing toward the back.
- Press the **C =** (Commodore) key and the **RUN/STOP** key to load the program.

Starting Play

After the title screen appears, press the **SPACE BAR** to begin. When the Ground Menu screen appears you have four simulations and three options to select from. Before beginning play, be sure to read over the CONTROLS and INSTRUMENTS sections to familiarize yourself with all the Controls involved in flying an F-15 jet fighter. A description and examples of the listed simulation and options are found under the STARTING THE SIMULATION section.

Note: The F-15 has relatively small lift and control surfaces, and very large engines. It is unforgiving to the novice pilot. Learning to fly it, particularly through combat maneuvers, takes some perseverance and lots of practice!

Controls

(See reference page on back panel and diagram in center of manual.)

You maneuver your F-15 jet using a variety of controls. Be sure to press and hold the keys indicated until the proper response occurs. All controls are indicated on your instrument panel which is described in the next section.

Elevators

The elevators pitch the aircraft UP and DOWN. They are operated by pressing keys **7** and **8** or by pushing the joystick **FORWARD** and pulling it **BACK.** Using the joystick may be difficult at first. Remember, pushing **FORWARD** on the joystick lowers the elevators and causes the aircraft to pitch down and pulling **BACK** raises the elevators and causes the plane to pull up.

Ailerons

The ailerons are used to roll the aircraft LEFT and RIGHT, and are controlled by the keys **5** and **6,** or by moving the joystick **LEFT** or **RIGHT.** Pressing key **5** or moving the joystick **LEFT** will roll the plane to the left.

Rudder

The rudder affects the yaw (heading or direction) of the aircraft. The rudder is controlled by key **Z** for the left rudder, and **X** for the right rudder. **Z** will yaw the plane to the left, **X** to the right.

During maneuvers, these controls interact in differing ways. For example, at near 90 degrees roll (or angle at bank) the elevator control has a primary effect on heading not pitch. The aircraft also tends to pitch nose down when in a steep turn. Your pitch rate, roll rate, and yaw (heading) rate all increase in proportion to how long these controls are applied. This realistically simulates the feel of piloting the F-15.

Throttle

The throttle controls the engine thrust. Thrust affects both the speed and the pitch angle of the aircraft. Press and hold down the **Q** key to open the throttle and increase engine thrust. Press and hold the **A** key to decrease thrust.

The amount of thrust required to maintain a particular speed depends primarily on the pitch angle and altitude. At low speeds (i.e. on a landing approach) you must give the F-15 a "nose-up" attitude to maintain adequate lift and avoid stalling. This increases the drag on the aircraft, demanding more thrust to maintain a given speed. At higher speeds where a "nose-up" attitude is not necessary, the same thrust will maintain a higher speed. Maximum speed increases with altitude because of decreasing air density. You must also be sure to use the throttle with the ground brakes to hold the plane in preflight position before take-off.

Flaps

The flaps are controlled by pressing **S** to extend them and **W** to retract them. Extended, the flaps increase the drag on the plane. They are used to slow down your approach speed and to reduce your rate of descent on landing. Fully extending the flaps lowers the stall speed to 120 knots. The pitch angle changes if you adjust the flaps while in flight. If you extend the flaps fully at speeds above 352 knots, or partially at speeds over 472 knots, they will fail. (The word FAIL will appear in red on the bottom left of your instrument panel.) Unless taking off or landing, flaps should not be extended.

Landing Gear

The landing gear is raised and lowered by pressing **U.** (See INSTRUMENTS for location on panel display.) Lowering the landing gear while in flight slows down the aircraft. If the landing gear remains extended at speeds above 300 knots, your plane will crash. Be sure to lower the landing gear before landing!

Brakes

The ground brakes are applied by pressing **B.** They can be used to hold your plane in preflight position on the runway until you reach maximum engine thrust. Once airborne, the brakes are no longer functional.
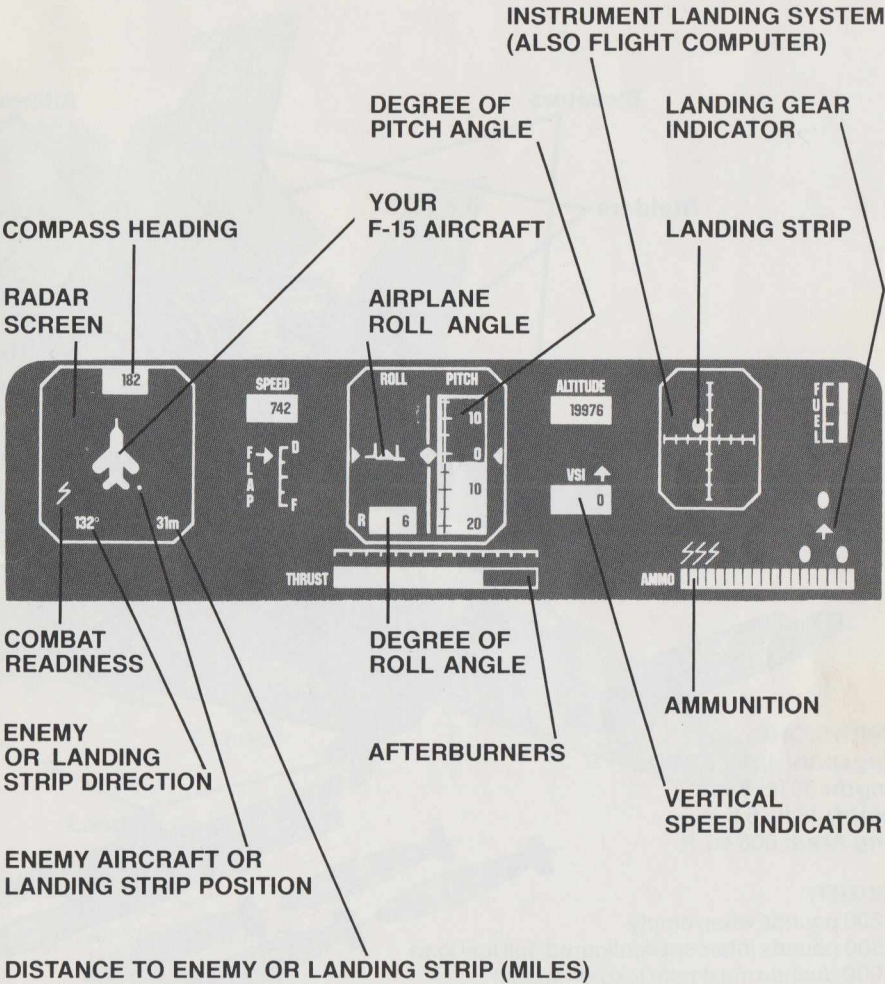
Cannon

When you detect an enemy, select the Combat Mode by pressing **C.** Your sights will appear and you can use them to zero in on the enemy. Press the **SPACE BAR** or push the **FIRE BUTTON** to fire your cannon. Be sure to keep an eye on your ammunition.

Map

Press **M** on the keyboard to display the map and ascertain your position relative to the airstrips and enemy aircraft. When switched on, the map replaces your cockpit view, however, the instrument panel will remain so that you can continue flying safely. Press **M** again to switch back to the cockpit view.

Instruments

COMPASS HEADING

RADAR
SCREEN

DEGREE OF
PITCH ANGLE

YOUR
F-15 AIRCRAFT

AIRPLANE
ROLL ANGLE

INSTRUMENT LANDING SYSTEM
(ALSO FLIGHT COMPUTER)

LANDING GEAR
INDICATOR

LANDING STRIP

182	SPEED 742	ROLL PITCH	ALTITUDE 19976		F U E L
	F→D L A P F	10 0 10 20	VSI ↑ 0		
132° 31m	THRUST	R 6		AMMO	

COMBAT
READINESS

ENEMY
OR LANDING
STRIP DIRECTION

ENEMY AIRCRAFT OR
LANDING STRIP POSITION

DEGREE OF
ROLL ANGLE

AFTERBURNERS

AMMUNITION

VERTICAL
SPEED INDICATOR

DISTANCE TO ENEMY OR LANDING STRIP (MILES)

Familiarize yourself with the instrument panel, in order to detect and
prevent crashing due to loss of altitude, stalling, and other pilot errors.

Technical Data

McDONNELL DOUGLAS F-15 EAGLE

Elevators

Ailerons

Rudders

Flap

BT
AF 7S 088

Flap
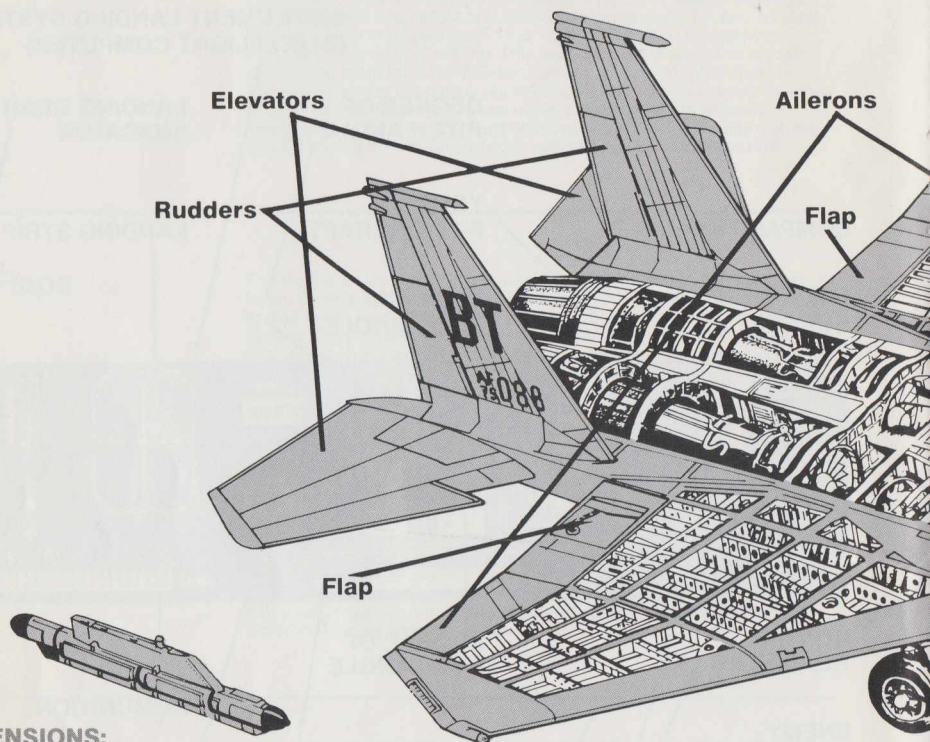
DIMENSIONS:
Wingspan: 42 ft., 9.75 in.
Length: 63 ft., 9 in.
Height: 18 ft., 5.5 in.
Wing Area: 608 sq. ft.

WEIGHT:
31,600 pounds when empty
41,500 pounds intercept configured, full fuel load
68,000 pounds maximum take-off weight

ARMAMENT:
The F-15C Eagle carries the following:
1 20mm M61A-1 cannon
4 Sparrow, now AMRAAM air-to-air missiles
4 Sidewinder, now ASRAAM air-to-air missiles
Optional 16,000 pound attack weapon load carried on five pylons
(four wing-mounted, one belly-mounted)

ALTITUDE/TIME RECORDS:
3,000 meters (approx. 9840 ft.) in 27.57 seconds
20,000 meters (approx. 65,600 ft.) in 122.94 seconds
30,000 meters (approx. 98,400 ft.) in 207.08 seconds
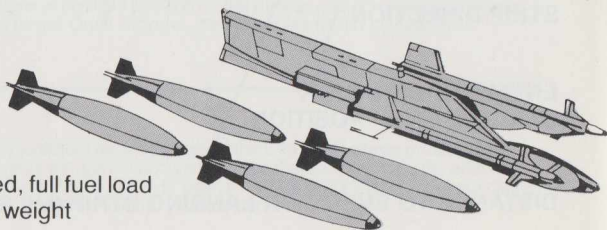
The McDonnell Douglas F-15 Eagle is a USAF air superiority jet fighter. It has two powerful engines, an immense wing span, and is unrivalled as a close combat dogfighter. It beat the previous MiG-25 altitude/time record by 36 seconds by climbing 30,000 meters (about 98,400 feet) in 207.08 seconds. The original F-15A was first flown in July, 1982. Since then the tandem-seat F-15B, single-seat F-15C, two-seat F-15D (which can hold an additional 9,750 pounds of fuel), and the F-15E Enhanced Eagle (which can carry a 24,000 bomb load) have been produced.

Cannon

Landing Gear
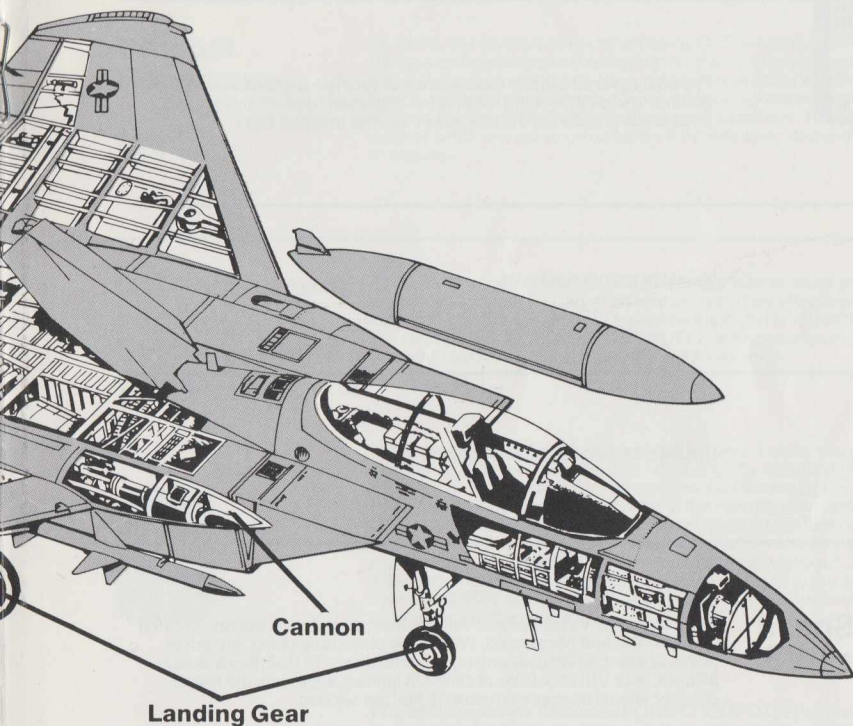
ROLE:
Air Superiority Fighter

PERFORMANCE:
Maximum Speed: 800 knots at sea level (mach 1.2)
1440 knots at 60,000 feet (mach 2.54)
Landing Speed: 130 knots
*Take-off Run:* 900 feet, 8 seconds with afterburners
Initial Climb Rate: Greater than 15,000 feet per minute

ENGINES:
Two Pratt & Whitney F100-PW-100 two spool turbofans, each delivering:
17,600 thrust, dry
25,000 thrust, afterburners

Artificial Horizon

Placed in the center of the panel, this instrument is your principal source of visual information other than the cockpit window. It shows the roll and pitch angles of your plane. This information is particularly critical during aerobatic maneuvers or in air-to-air combat, when you frequently lose view of the horizon.
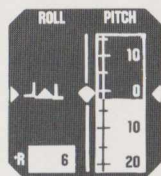
The pitch angle is shown on a "moving tape" indicator, which reads in degrees. The blue area indicates a skyward or "nose-up" attitude, yellow indicates a "nose-down" or descending attitude. 90 degrees is a vertical climb or dive. In certain situations, the pitch of your craft can change instantly from "nose-up" to "nose-down"—so be careful not to get disoriented.

The small aircraft symbol rotates to show your roll angle relative to the ground. The degree of the roll angle is displayed beneath this symbol. A roll angle greater than 90 degrees indicates inverted flight.

Speed

Indicates airspeed in knots.

Altitude

Displays the height you are flying at in feet.

Vertical Speed Indicator—VSI

(Also known as VVI or Vertical Velocity Indicator.) This is the rate of climb or descent in feet per second. When your plane is climbing, the arrow points upward; when descending, it points down. To maintain a steady altitude, your VSI should be at zero. On landing approach, the rate of descent should be approximately 20 feet per second.

Flaps

Flaps may be set at any extension from zero to full. Stall speed is lowered from 130 knots at zero flaps to 120 knots at full flaps.

Thrust

Engine thrust is indicated by the green and red bar scale. The green portion of the thrust range indicates 0 to 100% thrust. The red region beyond 100% represents afterburners. Afterburners give a considerable boost to your acceleration, but at the expense of heavy fuel consumption.
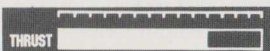
Radar and Compass

The stationary aircraft symbol points to your compass heading. Below the compass is the bearing and range of the navigational beacon on which you are currently logged. You can select the next beacon (next airstrip) by pressing **N.** The beacon identifier will change and new information will be displayed. The flashing cross on the radar screen shows the bearing of the beacon relative to your plane. To fly to the beacon, bank your plane until your heading matches the beacon. You will now see the flashing cross at the nose of the aircraft symbol on the radar screen.

Combat Readiness

Switch to the Combat Mode by pressing **C.** The Combat Mode arms your cannon and switches on your sights. A lightening symbol will appear to indicate Combat readiness. Your radar will now show the range and bearing of the enemy aircraft. Switch on your flight computer by pressing the function key **F7** to lock onto the enemy's position. The enemy will appear when you are approximately 2.9 miles away and within 5000 feet in altitude.

## ILS (Instrument Landing System) / Flight Computer

This dual-purpose system allows your plane to land under adverse conditions and lets you target enemy aircraft more effectively. When you begin a flight, the ILS is on. To switch on the FLIGHT COMPUTER, press the function key **F7.** FLIGHT COMPUTER will appear on the ILS screen. To switch back to ILS again, press the **F7** key again.

Instrument Landing System (ILS): The ILS gives you guidance on landing approaches. You can practice using it by selecting the LANDING PRACTICE simulation option (press 1 on the Ground Option Menu). Keep the flashing circle in the center of the instrument in order to fly the correct glidescope and the correct rate of descent (20 feet per second) for a good landing. As the flashing circle drifts from the center of this instrument, turn towards it to return to the correct approach. For example, if the circle drifts to the left and up, bank your aircraft to the **LEFT** and then pull **BACK** on the joystick or press key **8,** to return the flashing circle slowly to the center.

Flight Computer: Select the FLIGHT COMPUTER by pressing the function key **F7.** This will display your precise ground position, in feet, from any runway with a beacon within a radius of 6 miles. The distances are relative to the beacon currently indicated on your radar. If a runway has been destroyed or is out of range, the computer remains inactive. An inactive computer is indicated by black and yellow stripes.

The FLIGHT COMPUTER also displays the altitude of enemy aircraft but only when your plane is in the Combat Mode. During a dogfight, try to keep your altitude roughly equal to that of the enemy plane. After taking off, switch to Combat Mode and start the FLIGHT COMPUTER to zero in on the enemy.
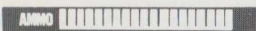
Fuel and Ammunition

Keep an eye on your fuel and ammunition during your flights—give yourself enough to get to the next airstrip safely. If you are low, land at the nearest airstrip.

Starting the Simulation

Now that you are familiar with the controls and instruments used in JET COMBAT SIMULATOR, prepare for take-off! Every flight begins with a ground check and JET COMBAT SIMULATOR is no exception. The Ground Check Menu offers several options. Choose any option by pressing the corresponding numbered key.

You can choose to fly any one of the following four simulations:

1. LANDING PRACTICE: Your aircraft is positioned at an altitude of 1700 feet, 6 miles from touchdown at runway BASE. The landing gears are lowered, ready for landing. Apply full flaps by pressing and holding the **S** key. Set your throttle at 80% (key **Q** or **A**) and keep your aircraft's nose up using the elevators (key **7, 8** or joystick **LEFT** and **RIGHT**). The objective is to maintain maximum lift at the low speed required for approach and landing. But be sure not to drop your airspeed below 120 knots or the F-15 will stall—even with full flaps. Guidance may be taken from the ILS system. Once you have landed, reduce the thrust to zero and apply the brakes (key **A** and then **B**).

2. FLIGHT TRAINING: Your aircraft is positioned at the threshold of runway BASE, facing due North. Take-off by opening the throttle by pressing **Q** (typically to 100% or to afterburner). Maximum acceleration can be achieved by applying the brakes (key **B**) until full thrust is reached. Then raise the elevators by pulling **BACK** the joystick or pressing key **8.** Release the brakes to begin take-off. Raise the landing gear shortly after take-off if you intend to exceed an airspeed of 300 knots (key **U**) and decrease thrust (key **A**). Take-off is possible at a lower speed with extended flaps. Steer on the ground by using the rudder controls. This is easier if your speed is below 10 knots.

3. AIR-TO-AIR COMBAT PRACTICE: You are positioned 2 miles behind the enemy plane at the same altitude. Select the Combat Mode by pressing **C** and your sights will appear on the cockpit window. Then turn on the flight computer by pressing the function key **F7** to obtain a readout of enemy bearing, range, and altitude. Your flight computer will automatically pilot you to engage the enemy. DO NOT use any controls to fly the plane when the flight computer is on until you spot the enemy. The enemy plane will be flying at 550 knots and will not return fire during the dogfight. Maneuver your aircraft when you see the enemy plane and open fire as it passes through your sights. The enemy plane will be visible through your cockpit window at approximately 2.9 miles and 5000 feet altitude.

4. AIR-TO-AIR COMBAT: You are responsible for defending four airfields: BASE, TANGO, DELTA, and ZULU. Your mission begins with a scramble from runway BASE. Use your radar and map (by pressing **M**) to determine the location of the enemy plane. After determining the enemy's most likely target, select the Combat Mode by pressing **C** and your sights will appear. Then turn on your flight computer by pressing **F7** to set your plane on an intercept course. (The words FLIGHT COMPUTER will appear on your ILS screen.) Fly the plane to the same altitude and in the direction of the enemy. Visual contact will occur when the enemy is within 2.9 miles of range and within 5000 feet of your altitude.

As the dogfight begins, the enemy aircraft wheels around to gain advantage. Get the plane in your sights, then fire your cannon by pressing the **SPACE BAR** or the **FIRE BUTTON.** A control panel indicator shows how much ammunition you have. Damage to your aircraft is

indicated by a change in color to your plane's symbol on your radar screen. Your aircraft can sustain three hits—the fourth is fatal. To break off an attack when you are running out of fuel, ammunition, or have sustained too much damage, either climb or descend 5000 feet from the enemy's altitude, or put at least two miles of sky between your positions. You are then free to land on any remaining airstrips for repairs, rearmament, and refueling. Meanwhile, the enemy plane will return to its original target course. Your job is to get back into the air quickly enough to prevent it from destroying all four of your airbases.

In any of these flight simulations, you can add either or both of these two flying conditions:

5. BLIND LANDING: This option simulates landing and take-off in fog. There is no visible horizon, and no visual display of the airstrip once your aircraft is above 50 feet. Navigate using your radar, flight computer, and map. To select, press key **5.** To turn off, press **5** again.

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6. CROSSWINDS AND TURBULENCE: This option gives crosswind effects and random in-flight disturbances due to turbulence. This option makes flying the F-15 more difficult—and more life-like. It is better to try this option after a little practice. Press **6** to turn on, press again to turn off.

Finally, you can select your adversary's skill level.

7. PILOT RATING: This feature will change the enemy aircraft's response to your combat maneuvers: how quickly it can detect you, how adeptly its pilot can maneuver, how easily he can get you in his sights, and how close you must be to shoot it down. Your pilot rating does not affect your own skills or the flight characteristics of your plane. Press the **7** key repeatedly to select the skill level of your opponent. But beware! An enemy ace makes a lethal adversary.

When you have chosen the level and conditions at which you wish to fly, press the **SPACE BAR** to begin.

PILOT'S NOTES

Take-off Speed:
Zero flaps—140 knots
Full flaps—130 knots

Stall Speed:
Zero flaps—130 knots
Full flaps—120 knots

Flaps:
Vmax (Velocity Maximum)
full flaps—352 knots
Vmax, any flaps—472 knots

Landing Gear:
Vmax, airborne—300 knots
Vmax, on the ground—250 knots

Performance:
Vmax, sea level, with full afterburners—802 knots
Vmax, 60,000 feet—1439 knots (max 2.5)

Ceiling:
Approximately 65,000 feet

Landing Characteristics:

Thrust	Flaps	Gear	Pitch	VSI	Speed
74%	Full	Down	+3	−9	125 knots
62%	Zero	Down	+6	−12	135 knots

Landing Normal: −15 max
Landing Gears Failed: −8 max

CONTROLS REFERENCE

Control	Function
Key 5 or LEFT with joystick	Ailerons—Roll Right
Key 6 or RIGHT with joystick	Ailerons—Roll Left
Key 7 or FORWARD with joystick	Lower elevator—Pitch Down
Key 8 or BACK with joystick	Raise elevator—Nose Up
Key Z	Left rudder—Yaw Left
Key X	Right rudder—Yaw Right
Key Q	Open throttle—Increase thrust
Key A	Close throttle—Decrease thrust
Key W	Retract (up) flaps—When in air
Key S	Extend flaps—Take-off or landing
Key U	Raise/Lower Landing gear
Key B	Brakes on
Key N	Next Beacon
Key M	Map on/off
Key F7	ILS/Flight Computer
Key C	Combat Mode
SPACE BAR or fire button	Fire cannon
Key H	Pause game
Key J	Resume game
RUN/STOP or RESTORE	Return to Menu

Note: When operating these controls, be sure to press and hold the key until the instrument panel indicates a response.

LIMITED WARRANTY

PROOF-OF-PURCHASE
EPYX
COMPUTER SOFTWARE
PRODUCT # 937 D